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REVIEW

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Patterns and perceptions of complementary/alternative medicine among paediatricians and patients' mothers: a review of the literature

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Abstract For many families and their children, the use of complementary/alternative medicine (CAM) is an accepted adjunct or alternative to conventional therapy, even if data available in the literature regarding risks and adverse drug reactions (ADRs) pertaining to childhood populations are scarce. Moreover, despite widespread and increasing use of CAM, there are limited data on how paediatricians communicate with mothers and/or patients about CAM. Therefore, we report the studies available in the literature in the paediatric field and summarise what is known about ADRs and risks of CAM, taking into account in particular problems related to interactions between phytotherapy and conventional medicines and to counselling. *Conclusion*: From the analysis of the literature, some interesting aspects emerge: (1) the extent of CAM use in the paediatric field is increasingly sought by parents of children with chronic illnesses; (2) most parents who choose CAM medicine for their children believe that these therapies are "natural" and thus "safe" and (3) physicians often feel to know too little about CAM and wish to learn more for different reasons including "to dissuade whether the alternative method is unsafe and/or ineffective". Therefore, paediatricians should be prepared to discuss alternative therapies with parents, since talking about CAM may help to minimise the risks and to restrain parental misconceptions and doubts. Educational interventions for parents should also be performed to bring about a more aware use of traditional and alternative medicines.

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Abbreviations *ADR* adverse drug reaction · *CAM* complementary/alternative medicine

Introduction

Complementary/alternative medicine (CAM) is increasingly popular for treating many different problems. While the amount of information on CAM use in adults is substantial and indicates that between 33% and 50% of the general population have tried at least one form of CAM [25,52], data pertaining to childhood populations are scarce since most surveys have excluded children from their analyses. However, for many families and their children, the use of CAM (particularly for chronic, recurrent or incurable conditions such as cancer, asthma, rheumatoid arthritis and cystic fibrosis) is an accepted adjunct or alternative to orthodox medical care and there is no doubt from the literature that the use of such treatments is widespread.

In Italy, a National Research Project on "unconventional therapies" was funded in 1999 by the Italian Ministry of Health and coordinated by the National Institute of Health in order to evaluate this complex phenomenon. The ultimate goal is to provide a scientific basis for a definition of a strategy in this field and a recently published paper [55], including also data referred to children, focused on the preliminary results of a nationwide survey.

Another aspect to be considered is that despite widespread and increasing use of CAM, there are limited data on how conventional medical practitioners communicate with their patients about CAM. Physicians frequently face questions about CAM, but, because of a lack of education and experience, are likely to respond to patients inquiries neutrally or negatively and feel uncomfortable discussing these treatments with their patients [17].

In this review we report on the available literature (derived from Medline and Cochrane library) regarding the use of CAM in paediatrics and summarise what is known about adverse effects, risks and interactions between CAM and conventional therapies. Moreover, we discuss problems related to a difficult communication between paediatricians and mothers about this topic.

Complementary medicine: definitions, knowledge and risks

CAM is defined as any medical practice that is neither widely available nor taught in conventional medical schools [17]. A definition recently adopted also by the Cochrane Field operating in this area of medicine indicates that CAM could be defined as "any diagnosis, treatment and/or prevention which complements mainstream medicine by contributing to a common whole, by satisfying a demand not met by orthodoxy or by diversifying the conceptual frameworks of medicine" [32]. In every case, CAM comprises many different disciplines, a wide spectrum of practices and philosophies which differ from conventional therapies: homeopathy, herbal medicine, aromatherapy, dietary supplements, megavitamin, acupuncture, probiotics, hypnosis, biofeedback, yoga and manipulative treatments. Conventional medicine traditionally aims to diagnose illness and treat, cure or alleviate symptoms; complementary disciplines aim not only to relieve symptoms and restore wellness, but also to help individuals in a process of self-healing within a holistic view of health. Illness is recognised as complex, embracing factors such as genetic predisposition, environment and diet. Relief or cure of symptoms is considered only a temporary respite, if the individual does not tackle the underlying cause [54].

Most people that use CAM consider these kind of therapies to be "natural" and thus "safe"; instead, many of these therapies, like other medical treatments, have the potential to be directly or indirectly harmful [21], even if the true incidence of CAM-induced adverse effects is unknown. Toxic effects, allergic reactions, lack of quality control, contaminations, interactions with concomitant medications are to be considered direct effects, while missed diagnoses, disregarding contraindications, delaying more effective treatments, discontinuation of prescribed drugs and self-medications are indirect effects [28]. These direct and indirect effects often derive from a lack of appropriate regulations in this field regarding either the providers or the products themselves (quality, purity, dosage), leading to an uncorrected and uncontrolled use of these remedies. In fact, while in some countries (Germany, Switzerland, France and Austria) many CAM treatments are licensed and fully integrated into conventional medicine with education and training for physicians and pharmacists, in other countries (such as the United Kingdom, United States and Canada) the majority of CAMs are still not regulated by statute and providers are not necessarily medically qualified practitioners. Therefore, users could not be informed in a reliable way about composition, instructions for use, storage and side-effects.

In particular, phytomedicines have the potential to elicit the same types of adverse reactions as synthetic drugs, since they consist of whole extracts or more commonly of defined parts of the plants (root, rhizome, leaf, flower-head) that contain numerous active molecules [28]. Moreover, in most countries herbs are sold as unlicensed food supplements or available to consumers as over-the-counter items in various preparations not regulated by the Federal Drug Administration with the same scrutiny as conventional drugs, with risks of contamination or adulteration with poisonous metals, non-declared herbs or conventional medicines.

Several examples can be given regarding this argument. Dried exudate from aloe (*Aloe barbadensis*) leaf (not gel) contains anthranoids with laxative effects; primrose oil and bovine colostrum can cause nausea and gastric discomfort. Ginkgo, garlic, ginseng have antiplatelet effects and cat's claw has been described to cause hypotension. Fruits of the *Capsicum spp* can cause gastric irritation and hepatorenal toxicity and *Lobelia* may cause nausea, vomiting, dizziness and diarrhoea. Excessive or prolonged ingestion of glycyrrhizin-containing licorice can lead to amenorrhoea and pseudohypoaldosteronism [14]. Concerning the use of herbal medicines in children, as indicated in Table 1, some severe adverse reactions have been reported and paediatricians act with caution with regard to the long-term use of herbs, even if causality is sometimes uncertain and adverse events could have been caused by overdosing or contamination of the remedy rather than by the herbal ingredient itself. An early fatal colitis was observed in a 4-year-old boy following exposure to the alkaloids

Table 1 Case reports of severe adverse reactions in children after administration of herbal preparations

Reference	Herb	Patient	Adverse reaction
[50]	*Chelidonium majus*	4-year-old child	Fatal colitis
[4]	Pyrrolizidine alkaloids	Neonate[a]	Fatal liver injury
[8]	Siberian ginseng	Neonate[a]	Androgenisation
[44]	Jin Bu Huan	Small children	Bradycardia, respiratory depression
[39]	Garlic	6-month-old infant	Burns
[13]	Garlic	6-year-old child	Necrotic ulcers
[9]	Mint tea	Two infants	Multiple organ failure
[34]	Asafetida gum	5-week-old infant	methaemoglobinaemia

[a]Exposure during pregnancy

detected in *Chelidonium majus* [49]. A fatal neonatal liver injury was related to the mother's assumption of a herbal cough tea containing 0.6 mg pyrrolizidine alkaloids throughout pregnancy [60]. A case of neonatal androgenisation was associated with maternal use of Siberian ginseng tablets during pregnancy [7]. Other case reports documented life-threatening bradycardia and respiratory depression in small children following unintentional overdosing of the Chinese remedy Jin Bu Huan containing large amounts of tetrahydropalmatine [43]. A 6-month-old infant suffered garlic burns when his father applied crushed garlic cloves to the wrists [37], while a 6-year-old child developed a necrotic ulcer on her foot after her grandmother applied crushed garlic under a bandage as a remedy for a minor sore [12]. Two cases of serious or fatal toxicity have been described in two infants who had been given 90 to 120 ml of mint tea containing pennyroyal oil for colic and minor ailments [8]. A case of methaemoglobinaemia in a 5-week-old infant treated with a gum asafetida preparation has been recorded [28].

As regards homeopathic remedies, most but not all are too diluted to cause toxic effects and ADRs are probably rare: the fact is that, at present, we cannot tell their true incidence as no definitive study has ever been carried out. In every case, potentially toxic concentrations of arsenic [47] and cadmium [20] have been described in homeopathic remedies. Concern has also been voiced about potentially carcinogenic effects of low potencies of *Aristolochia* [59]. One case of acute pancreatitis has been reported following the administration of a complex homeopathic drug containing 19 different ingredients [3].

Furthermore, there is a continuing lack of quality control of "dietary supplements" [22]. A food supplement consisting of oyster extract, ginseng, taurine and zinc has been associated with a case of Quincke facial oedema [4]. Propolis has been increasingly associated with cases of allergy, mostly dermatitis arising from topical application, but a few reports describe an allergic reaction after oral ingestion; contamination of propolis capsules with excessive levels of lead has also been reported [5]. Selenium in overdose can also be harmful: in one case, selenium poisoning resulted from an underestimation of the selenium content in a nutrition supplementation [16]. Fish oil supplements rich in long-chain polyunsaturated fatty acids may cause diarrhoea, epigastric discomfort and detrimental effects in patients with asthma [28]. Fumaric acid and its derivatives, used in some countries for psoriasis, may cause acute renal failure which is only partially reversible [28]. L -Tryptophan, a naturally essential aminoacid advocated as innocuous for the treatment of depression, insomnia, and stress was associated in the United States with an epidemic eosinophilia-myalgia syndrome [18].

Acupuncture, predominantly used to alleviate pain, is often assumed to be free of risks. This is not entirely true, since tissue trauma, pneumothorax and allergies have been reported [26]. Manipulative therapies (chiropractic, osteopathy) particularly when involving the cervical spine, are also associated with complications such as vascular accidents [28].

Another important aspect is that CAM is often taken together with traditional pharmacological therapies, with an improving risk of adverse reactions due to possible interactions [29]. In clinical practice, patients sometimes add various over-the-counter medications, vitamins, herbs and foods to drugs prescribed by physicians that potentially can interact. Unfortunately, the true prevalence of these interactions is unknown. In fact, experimental data are limited, case reports scarce and under-reporting a common situation. In a review by Fugh-Berman [35], an analysis of the published data revealed that many reports of herb-induced interactions lack crucial documentation on temporal relations and on a positive identification of the herbs involved. Moreover, labelling of herbal products may not accurately reflect their contents [11]: the addition of pharmaceutical drugs such as paracetamol, indomethacin, prednisolone and caffeine to herbal products is a particular problem with Chinese medicines [44] and heavy-metal contamination is common in Asian herbal products [48]. In every case, some interactions with drugs used also in paediatrics are known and are to be taken into account. For example, as reported in Table 2, a survey of the literature indicates that a number of herbal supplements have anti-platelet (ginkgo, garlic, ginseng, ginger) and anticoagulant (coumarin-containing herbs like red clover and chamomile) properties and could potentially interact with non-steroidal anti-inflammatory drugs with an increased risk of bleeding and prolonged clotting time respectively [71]. Although herb-acetaminophen interactions are not common, the possibility of such interactions has been mentioned as regards ginkgo [61] and supplements containing coumarin derivatives like chamomile and red clover [45]. Moreover, it is reasonable to assume that the combined use of acetaminophen and herbs containing salicylate (meadow-sweet and willow) can result in nephrotoxicity [51], while an interaction with echinacea [56] or kava [50] could cause liver toxicity. Interactions may occur at the CNS level between opioids and herbal supplements with sedative properties (valerian, kava, chamomile) [51]. *Areca catechu* (betel) nut contains arecoline, a cholinergic alkaloid known to counteract with prednisolone and salbutamol [68] leading to an inadequate control of asthma; Chilli pepper increases the bioavailability of theophylline [10]; St John's wort can reduce serum cyclosporine and theophylline concentrations [46,58] and interact pharmacodynamically with serotonin-reuptake inhibitors by induction of cytochrome P450 isoenzymes [39]. Herbs with immunostimulatory effects (licorice, echinacea), zinc and vitamin E should not be given with immunosuppressants [56]. Any laxative herb (anthranoid-containing senna, cascara sagrada, aloe) will speed intestinal transit and thus may interfere with the absorption of many intestinally absorbed drugs [72].

Table 2 Examples of changes in pharmacological effects of drugs (mainly increased toxicity) due to interactions between herbal preparations and conventional medicines used in paediatrics

Reference	Herbal compound (part used)	Drug	Pharmacological effect
[11]	Chilli pepper (fruit)	Theophylline	Increased bioavailability
[68]	Betel (fruit)	Prednisolone, salbutamol	Inadequate control of asthma
[72]	Senna (leaf), cascara, sagrada (bark), aloe (leaf)	Drugs absorbed intestinally	Increased speed of intestinal transit
[61]	Ginkgo (leaf)	Acetaminophen	Bilateral subdural haematoma
[46]	Red clover (flower-head), chamomile (flower-head)	Acetaminophen	Inhibition of platelet aggregation
[19]	St. John's wort (aerial part)	Serotonin-reuptake inhibitors	Pharmacodynamic interaction
[57]	Echinacea (root/rhizome)	Acetaminophen	Liver toxicity
[57]	Licorice (root), echinacea (root)	Immunosuppressants	Decreased immunosuppressant effects
[52]	Meadow-sweet (herb), willow (bark)	Acetaminophen	Nephrotoxicity
[52]	Valerian (root), kava (rhizome), chamomile (flower-head)	Opioids	Increased CNS depression/sedation
[59]	St. John's wort (aerial part)	Theophylline	Decreased concentrations
[47]	St. John's wort (aerial part)	Cyclosporine	Decreased concentrations
[71]	Ginkgo (leaf), garlic (bulb), ginseng (root), ginger (rhizome)	Non-steroidal anti-inflammatory drugs	Increased risk of bleeding
[71]	Red clover (flower-head), chamomile (flower-head)	Non-steroidal anti-inflammatory drugs	Prolonged clotting time
[51]	Kava (rhizome)	Acetaminophen	Liver toxicity

In the case of concomitant treatments with homeopathic remedies and drugs, interactions are conceivable even though there is no published evidence on this matter [28]. Also interactions between dietary supplements and conventional therapies have been reported [35,56]. For example, fish oil could interfere with antithrombotic agents [40] and with metabolic control in diabetic patients not treated with sulphonylurea derivatives [65]; the addition of L-carnitine to long-term acenocoumarol therapy may result in marked potentiation of this anticoagulant [28].

Literature in the paediatric field

How much CAM is used in children is unknown, but its use is increasing. Recent publications, shown in Table 3, indicate that complementary treatments are frequently sought by parents of children with chronic illnesses, while the degree to which these remedies are given to children with common acute illness is less described.

In a systematic review aimed at summarising the data known about CAM use in pediatric populations [27], ten studies published from 1977 to 1997 were reported. The prevalence of CAM use was generally high even if variable since the study populations differed among the surveys in terms of methodology (questionnaire-based, interviews), size and country of origin (United States, Canada, Australia, United Kingdom, Norway, Finland). CAM was often perceived as helpful, while insufficient data were reported about safety and costs. It seems that a considerable proportion of children are treated with some type of CAM. In particular, children suffering from chronic conditions not curable by conventional treatments (juvenile rheumatoid arthritis, cancer, asthma, psoriasis) seem to be associated with a particularly high prevalence.

Other authors [2] studied the nature and prevalence of alternative therapies used by 51 children aged 1–6 years with asthma who were admitted to the Women's and Children's Hospital in South Australia. From the analysis of questionnaires completed by parents, approximately 55% of children used complementary therapies for asthma management, mostly relaxation exercises, massage, diet therapy and vitamins. Armishaw and Grant [6] considered a population sample of 251 children aged 0–14 years (mean age 2.9 years) with acute illnesses (asthma, pneumonia, bronchiolitis, gastroenteritis or fever) admitted to a general paediatric service at the Metropolitan Children's Hospital of Auckland from February to July 1998; data were collected by the interviews to parents and by the medical records of children. Of children enrolled in the study, 18% (44 of 251) and 29% (72 of 251) had received complementary treatments during the illness leading to hospitalisation or during some periods respectively. The severity of illness on presentation to hospital was unaffected by previous administration of complementary treatment and the type of treatment varied with ethnicity.

Since chronic illness is a potential stressor for sick children and their families [69], Hernandez-Reif et al.

Table 3 Examples of studies on CAM use in paediatric populations. (*n.m.*not mentioned)

Reference	Sample (country)	Use (%)	Type of treatment (%)
[2]	51 children (1–6 years) with asthma (Australia)	55	Vitamins (n.m.), diet therapy (n.m.), relaxation exercises (n.m.), massage(n.m.)
[38]	1,899 children (< 16 years) with acute illnesses (Italy)	39	Homeopathy (61.66), phytotherapy (20.2)
[31]	Children with acute and chronic conditions (databases of 10 previous publications)	9–70	Variable with country of origin
[7]	251 children (0–14 years) with acute illnesses (New Zealand)	18 during illness, 29 at some points in their lives	Variable with ethnicity
[64]	1,230 children (< 16 years) (UK)	17.9	Homeopathy (61), aromatherapy (36.4), herbal medicine (24), manipulative treatments (22.1), acupuncture (2.6)
[21]	92 children (0.5–16 years) with gastrointestinal problems (Australia)	35.9	Homeopathy (n.m.), aromatherapy (n.m.), herbal medicine (n.m.), vitamins (n.m.), acupuncture (n.m.), natural remedies
[43]	208 children (0.5–20 years) with chronic intestinal bowel disease (USA, UK)	41	Vitamins and minerals (19), dietary supplements (17), herbal medicine (14), homeopathy (6)
[62]	174 children (0.7–18.8 years) with asthma (Australia)	51.7	Vitamins and minerals (53.2), homeopathy (13.8), herbal medicine (29)
[56]	Children (< 14 years) (Italy)	9.2	Homeopathy (84)
[70]	3,057 children (0–14 years) (Italy)	46.1	Homeopathy (72), herbal medicine (17), manipulative treatments (6), acupuncture (5)

[41] measured the effects of 20 min massage therapy every night for 1 month on 20 children with cystic fibrosis to reduce anxiety and to improve peak air flow. During the study period, children continued to receive standard medical care. Benefits in terms of less anxiety and facilitated breathing were observed.

More recently, in a cross-sectional population survey undertaken in the south-west of England [64] the authors observed that acute conditions were predominantly represented, indicating that complementary medicine is commonly used for short self-limiting conditions such as upper respiratory tract infections. The study, including 1230 children under 16 years of age, showed that 17.9% of children used CAM at least once. Homeopathy, aromatherapy and herbal medicine were the most frequently used, mainly because of word-of-mouth recommendation, dissatisfaction or fear of side-effects related to conventional medicine. In another paper [19] a questionnaire was developed with the purpose to ascertain the frequency of the use and the acceptance of CAM and the probiotic therapies by children attending outpatient gastroenterology clinics for a variety of problems (inflammatory bowel disease, gastro-oesophageal reflux, coeliac disease, constipation). The parents of 92 children aged from 0.5 to 16 years completed the questionnaires: 35.9% (33 out of 92) reported that their children were currently taking or had recently taken one or more CAM (homeopathy, aromatherapy, herbal remedies, multiple vitamin therapies, acupuncture, naturopathic remedies). Among the 33 children using CAM, 45% improved during use of the therapy and no adverse effect was reported. Parents derived their information from a multitude of sources, in particular physicians, family members and friends. Moreover, 22.3% took probiotics regularly, often together with CAM. Other authors [42] examined CAM use in children and young adults admitted to three paediatric gastroenterology centres (Boston, Detroit, London) for chronic inflammatory bowel disease. From this cross-sectional survey comprising 208 children, the frequency of CAM use was 41%. The most common CAMs were megavitamin therapy, dietary supplements and herbal medicine, assumed in addition to conventional therapies (mainly corticosteroids, 5-ASA and azathioprine/6-mercaptopurine). The most important reason for using CAM were the child's improved health. The only significant predictor of CAM use was the number of adverse effects experienced with conventional medicines. A 3-month survey of asthmatic inpatients and outpatients of a teaching paediatric hospital was

undertaken [62]. Parents of 174 asthmatic children, all on therapy with bronchodilators and disodium cromoglycate or inhaled steroids, answered a structured questionnaire about the past and present usage of CAM by their children. Of the children, 51.7% had used at least one CAM in their lifetime, mostly vitamins, minerals, homeopathic and herbal preparations. Compared to non-users, users of CAM were older and significantly more likely to have persistent asthma, to be on high-dose inhaled or to receive oral steroids, to have poor control of symptoms and more doctor's visits and have more adverse reactions to bronchodilators.

Concerning the situation in Italy, 19 paediatricians of Veneto region distributed an anonymous questionnaire to 2,850 parents of children under 16 years of age [36]. The analysis of 1,899 questionnaires considered as valid (66.6%) showed that 39% of children used CAM at least once in their life, particularly homeopathy (61.66%) or phytotherapy (20.20%), usually for respiratory and ear, nose and throat complaints within the first 5 years of life. The choice for a CAM treatment was mostly influenced by personal beliefs (50%), sometimes by paediatricians (22%) or friends/family (16%) but rarely by mass-media (1%). The physician was informed by the parents about the use of CAM in 62% and 80% of cases if he was himself a non-prescriber or prescriber respectively. Fear of side-effects of conventional therapies was the main reason for CAM use. The rate of satisfaction with CAM was impressive: 81% of the mothers thought that the clinical improvement was due to the CAM use but it was not clear if CAM was used as substitutive of or adjunctive to conventional remedies. In a recently published study [55], 15.6% of the population used at least one unconventional therapy in the period 1997–1999, a lower proportion compared to those observed in other European countries [31, 34,38]. In particular, the use of unconventional therapies was quite high in children: 9.2% of children younger than 14 years of age had used at least one type of unconventional therapy, mostly represented by homeopathy (84%). Homeopathic treatment of children was strongly linked to parental beliefs. This form of treatment was often based on a physician's or other people's advice, while mass-media information had only a minor influence. The general practitioner was not always informed by the patient about the use of unconventional therapies, suggesting a flexible attitude towards these therapies. An expected lower toxicity of unconventional medicine was the most frequent reason for use. In another paper [70], CAM use among a paediatric population of 3,057 children (aged 0 to 14 years) living in three regions of the north-west of Italy was investigated, using questionnaires given to parents. Of the children, 46.1% used at least one unconventional therapy, mostly homeopathy (72%) and herbal medicine (17%) in 21% of cases associated to traditional therapy, for conditions such as ear nose and throat problems (33%), allergies (12%), dermatological (10%) or gastrointestinal (7%) problems, and sleep disorders (9%). The CAM use was very high in children under 5 years of age. The mothers of CAM-using children tended to be well-educated and took CAM themselves. Unconventional therapy was generally based on a physician's (60%) or pharmacist's (18%) advice, but in 9% of cases was due to self-prescription.

Counselling on the use of complementary/alternative medicines in children

Every study on the epidemiological characteristics of CAM has underscored the fact that only a few patients and parents discuss CAM use with their physician [63]. Therefore, in the light of the findings indicating a substantial use of CAM, paediatricians need to be more aware that some of their patients may use an alternative medicine. Clinicians should ask parents about the use of CAM in a relaxed way and in a manner that does not denigrate the parents' genuine efforts to seek help for their sick children: a disapproving manner will ensure only that a parent will conceal the further CAM use. Many authors suggested that a lack of time for discussion with paediatricians drives people to different types of practitioners [9,15]: about efficacy and safety of CAM a clinician and a patient or parent may have a different opinion, and parents appreciate the greater attention and time often given by alternative practitioners. Another possibility is that parents ask pharmacists directly for CAM. In this case, the role of the pharmacist is crucial in giving information about efficacy, safety and dosing guidelines, above all for herbal products in children. Moreover, if CAM therapies are to be used in children with serious disorders, pharmacists should encourage parents to seek professional advice from a paediatrician before treating children with an alternative remedy [13].

Only when parents feel comfortable about entering into dialogue with practitioners on the use of complementary treatments, it will be possible to identify those treatments and beliefs harmful or potentially beneficial. The parent should be treated as a partner in watching out for adverse reactions or interactions and the need for open communication about the use of these therapies. Formulations, doses and reasons for use should be documented and updated regularly. Details should be given about interactions between herbal supplements and conventional drugs, whose effects could be additive or synergistic, but also antagonistic to the action of the drugs, involving pharmacodynamic and pharmacokinetic mechanisms [1]. Moreover, when CAM is revealed and conventional medical therapy is crucial, the importance of continuing the conventional medicine has to be emphasised. In fact, seeking complementary treatments could potentially cause serious harm by delaying or preventing the use of orthodox medical care for those with severe illnesses. For example, three case reports about dangers of unconventional remedies in children have been reported [66], referring to children with juvenile rheumatoid arthritis: parents stopped

completely or partially the initial traditional treatments (acetylsalicylic acid, corticosteroids, gold therapy) and chose CAM therapies (diet restrictions, acupuncture etc.) resulting in a deterioration of arthritis.

As reported by some authors [19,67], three major characteristics usually differentiate users of alternative medicine from non-users: (1) the child's age (only a minority is under 1 year of age); (2) parental use of CAM and (3) maternal education (better educated mothers are more likely exposed to numerous sources of information). Concerning the reasons for CAM use, it is important to understand parents' motivations in considering alternative remedies for their children. In fact, the use of CAM is not always related to dissatisfaction with standard therapies [23] but often to fear of side-effects of conventional remedies [53,67], personal beliefs [57], attempts of different approaches or to persistent medical problems [67]. In fact, in many cases, chronic conditions (cancer, juvenile rheumatoid arthritis, cystic fibrosis etc.) are associated with CAM use; in other situations, respiratory, musculoskeletal, or ear-nose-throat problems are involved. In the first case parents tend to turn to complementary medicine in the hope to obtain better results when conventional treatments are too toxic or palliative, while in the second case anxiety to resolve fastidious symptoms for their children could be the reason of CAM use.

With regard to the attitudes of practitioners toward CAM, as reported in an interesting study published by Corbin-Winslow et al. [17], physicians commonly did not explicitly inquire about CAM use; when specific enquiries were made, it was related to a higher level of comfort in discussing such modalities. Moreover, from the analysis of 276 surveys, 60% of physicians wanted to learn more about CAM for five different reasons: overall "to dissuade the patient if the alternative method is unsafe and/or ineffective", but also "to recommend a method if safe and effective" and "to satisfy patients' asking", together with educational and insurance reasons.

Discussion and future perspectives

The questions related to efficacy, safety and costs of CAM use in paediatrics are largely unanswered at present. In particular, there are insufficient data to show that CAM is safe and paediatricians should insist on such evidence before endorsing CAM use for their patients. On the other hand, in view of the generally high prevalence of CAM use in children and the risks of interactions with conventional therapies [29], knowledge about CAM use is important, while physicians often feel that they know too little about CAM [33]. Moreover, talking about CAM with parents has other important implications and may help to minimise the risks [24,30]. Creating a trusting relationship within the clinical setting could increase the possibility of a discussion about possible adverse effects due to CAM use, relieving parental misconceptions and doubts not sustained by scientific elements. Therefore, paediatricians should be prepared to discuss alternative therapies with parents, facilitating a more open doctor-parent relationship. Our review highlights the importance of training for paediatricians to improve their knowledge of CAM and to educate them about communication strategies. Moreover, educational programmes for parents should be available to provide greater awareness about the use of medicines including CAM. Further studied are needed to evaluate the long-term effectiveness of such interventions.

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